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other device for providing input data to the computer.
Output device 116 can be a display device, printer, or
other device for providing output data from the computer.--

Page 32, line 16, delete "implementations"

In the Claims:

Delete claims 1-15 without prejudice and add the following
new claims:

B
~~16.~~ 16. A method for generating a lexical knowledge base in
a memory of a machine, comprising the steps:

(a) parsing a segment of text to obtain a logical form
corresponding thereto using a natural language parser associated
with said machine;

(b) using said machine to extract from the logical form a
complex semantic relation structure, the complex semantic
relation structure including at least a headword, a semantic
relation, and a value; the value of said complex semantic
relation structure including a primary value term, a lower level
relation, and a lower level value term;

(c) storing in the lexical knowledge base in said machine
memory the complex semantic relation structure in association
with the headword; and

(d) augmenting the lexical knowledge base by:

- (1) inverting the semantic relation structure; and
- (2) storing in said memory, in association with the primary value term, the inverted complex semantic relation structure, said stored inverted complex semantic relation structure including the lower level relation and the lower level value term.

17. The method of claim 16 in which the natural language parser analyzes for at least 8 of the following semantic relations: part, part_of, typical_subject, typical_subject_of, typical_object, typical_object_of, purpose, purpose_of, location_of, located_at, and synonym.

18. The method of claim 16 which includes:

- (a) providing a natural language corpus;
and in which the parsing step includes:
 - (b) analyzing the corpus by machine to identify a set of text segments therein;
 - (c) automatically discerning from the text segments a first collection of complex semantic relation structures; and
 - (d) storing data from the first collection of complex semantic relation structures as part of the lexical knowledge base;

and in which the augmenting step includes:

(e) inverting the first collection of semantic relation structures to yield a second collection of corresponding, inverted semantic relation structures; and

(f) storing data from the second collection of corresponding, inverted semantic relation structures in said memory.

19. The method of claim 18 in which the parsing step includes string searching the corpus by machine to discern semantic relation structures.

20. A method for generating a lexical knowledge base in a machine, comprising the steps:

(a) using a natural language parser associated with said machine to parse a segment of text to obtain a logical form;

(b) using said machine to extract from the logical form a semantic relation structure, the semantic relation structure including at least a headword, a semantic relation, and a value;

(c) storing in a memory associated with said machine the semantic relation structure in association with the headword in the lexical knowledge base; and

(d) augmenting the lexical knowledge base by:

(1) inverting the semantic relation structure; and

(2) storing, in association with the value, the inverted semantic relation structure.

21. The method of claim 20 in which the semantic relation structure includes (one or more elements) in addition to a headword, a semantic relation, and a value.

22. The method of claim 21 in which:

the value of the extracted semantic relation structure includes a primary value term, a lower level relation, and a lower level value term; and

the augmenting of the lexical knowledge base includes storing in association with the primary value term the inverted semantic relation structure, said stored inverted semantic relation structure including the lower level relation and the lower level value term.

23. The method of claim 21 which includes providing an on-line dictionary from which the text is automatically parsed, the on-line dictionary providing a plurality of definitions for a given term, each of said definitions defining a sense of the term, said senses being numbered in the on-line dictionary, and in which the augmenting of the lexical knowledge base includes

storing in association with the inverted semantic relation structure a dictionary sense number associated therewith.

24. The method of claim 21 in which the parser is a broad coverage parser.

25. The method of claim 21 in which the parsing step includes:

(1) applying a first set of rules to the segment of text to yield a syntactic structure corresponding thereto; and

(2) applying a second set of rules to the syntactic structure to produce the logical form.

26. The method of claim 20 which includes:

providing a natural language corpus;

using the machine to analyze the corpus to identify a collection of text segments therein;

performing steps (a) - (d) a first time on the identified text segments to produce an augmented lexical knowledge base, the augmentation of the knowledge base serving to enhance subsequent text parsing; and

performing steps (a) - (d) a second time on the identified texts to further augment the knowledge base;

wherein the augmentation of the lexical knowledge base by the first performance of steps (c) and (d) enhances the parsing of the texts in the second performance of step (a).

27. The method of claim 26 which includes:

when performing step (b) the first time, extracting a first set of semantic relations; and

when performing step (b) the second time, identifying a second set of semantic relations, the second set of semantic relations being different from the first.

28. The method of claim 27 in which only the first set of semantic relations includes "hypernym."

29. The method of claim 27 in which only the first set of semantic relations includes "user," "domain" and "manner."

30. A machine-implemented method for generating a lexical knowledge base comprising the steps:

using a computer to automatically process a text and identify a first semantic relation structure therein, said first semantic relation structure including more than three elements;

using the computer to invert the first semantic relation structure to yield a second corresponding, inverted semantic relation structure; and

storing data from the second semantic relation structure as part of a lexical knowledge base.

31. The method of claim 30 in which:

the identified semantic relation structure includes a headword, a primary relation, and a primary value;

the primary value includes a primary value term, a lower level relation, and a lower level value term; and

the storing includes storing in association with the primary value term the second semantic relation structure, said stored, second semantic relation structure including the lower level relation and the lower level value term.

32. The method of claim 30 which includes providing an on-line dictionary from which the text is parsed, the on-line dictionary providing a plurality of definitions for a given term, each of said definitions defining a sense of the term, said senses being numbered in the on-line dictionary, and in which the augmenting of the lexical knowledge base includes storing in association with the inverted semantic relation structure a dictionary sense number associated therewith.

33. The method of claim 30 in which the identifying step includes automatically parsing the text with a natural language parser, the parsing including:

applying a first set of rules to the text to yield a syntactic structure corresponding thereto;

applying a second set of rules to the syntactic structure to produce a corresponding logical form; and

extracting from the logical form a semantic relation structure including at least a headword, a semantic relation, and a value, said extracted semantic relation structure being said identified semantic relation structure.

34. The method of claim 33 in which the natural language parser analyzes for at least 8 of the following semantic relations: part, part_of, typical_subject, typical_subject_of, typical_object, typical_object_of, purpose, purpose_of, location_of, located_at, and synonym.

35. The method of claim 30 in which the identifying step includes string searching the text to discern semantic relation structures.

36. The method of claim 30 which includes:

(a) providing a natural language corpus;

and in which the identifying step includes:

(b) analyzing the corpus by machine to identify a set of text segments therein;

(c) automatically discerning from the text segments a first collection of semantic relation structures; and

(d) storing data from the first collection of semantic relation structures as part of the lexical knowledge base;

and in which the inverting step includes:

(e) inverting the first collection of semantic relation structures to yield a second collection of corresponding, inverted semantic relation structures;

and in which the storing step includes:

(f) augmenting the lexical knowledge base by storing data from the second collection of corresponding, inverted semantic relation structures.

37. The method of claim 36 which includes performing steps (a) - (f) a first time, the augmentation of the knowledge base resulting from performance of step (f) serving to enhance subsequent discernment of semantic relation structures, and then repeating steps (c) - (f) a second time; wherein augmentation of the knowledge base by the first performance of step (f) enhances the discerning of semantic relation structures by the second performance of step (c).

38. The method of claim 37 which includes discerning a first set of semantic relation structures in the first performance of step (c), and discerning a second set of semantic relation structures in the second performance of step (c), the second set of semantic relations being different from the first.

39. The method of claim 38 in which only the first set of semantic relations includes "hypernym."

40. The method of claim 38 in which only the first set of semantic relations includes "user," "domain" and "manner."

41. In a machine-implemented method of generating a lexical knowledge base comprised of using a computer to parse a collection of texts to identify semantic relation structures, and storing data from said semantic relation structures in the lexical knowledge base, an improvement comprising using the computer to iteratively parse the same collection of texts, successive parsings relying on successively enhanced versions of the lexical knowledge base, wherein semantic relations identified in one parsing operation serve to enhance discernment of semantic relations in subsequent parsing operations.

42. The method of claim 41 in which the iterative parsing includes:

(1) applying a first set of rules to the collection of texts to yield a collection of syntactic structures corresponding thereto;

(2) applying a second set of rules to the syntactic structures to produce corresponding logical forms; and

(3) applying a third set of rules to the logical forms to obtain semantic relation structures, said structures including at least one instance of a triple comprising a headword, a semantic relation, and a value.

43. A system comprising:

(a) machine-implemented means for parsing a segment of text to obtain a logical form;

(b) machine-implemented means for extracting from the logical form a semantic relation structure, the semantic relation structure including at least a headword, a semantic relation, and a value;

(c) computer memory defining a lexical knowledge base in which the semantic relation structure associated with the headword is stored; and

(d) means for augmenting the lexical knowledge base including means for: